

CLAIMS

What is claimed is:

1. A method of controlling the distribution of traffic flow in a load-sharing redundancy group comprising a first gateway device and a second gateway device configured to forward packets sent from hosts, the method comprising:
 - assigning a first plurality of forwarding addresses to the first gateway device;
 - assigning a second plurality of forwarding addresses to the second gateway device;
 - distributing forwarding addresses to hosts to use in sending packets to the redundancy group;
 - the hosts sending packets using the distributed forwarding addresses;
 - measuring the traffic flow for each of the assigned forwarding addresses;
 - comparing the measured traffic flow to a target traffic flow; and
 - adjusting the traffic flow.
2. The method of Claim 1 wherein each forwarding address is a MAC address.
3. The method of Claim 2 wherein each MAC address is a vMAC address.
4. The method of Claim 1 wherein adjusting the traffic flow comprises altering the distribution of forwarding addresses to hosts.

5. The method of Claim 4 wherein altering the distribution of forwarding addresses to hosts comprises replying to ARP inquiries from hosts using the forwarding address having the lowest measured traffic flow on the gateway device having the lowest measured traffic flow.
6. The method of Claim 1 wherein adjusting the traffic flow comprises re-assigning a forwarding address to a different gateway device.
7. The method of Claim 1 wherein the first gateway device is a first router and the second gateway device is a second router.
8. The method of Claim 1 wherein the redundancy group is configured to provide failover services in the event that one of the gateway devices ceases operation.
9. The method of Claim 1 wherein the target traffic flow is equal distribution of traffic across the first gateway device and the second gateway device and further wherein adjusting the traffic flow comprises adjusting the traffic flow across the first gateway device and the second gateway device to more equally distribute the measured traffic flow between the first gateway device and the second gateway device.
10. A method of controlling traffic flow in a load-sharing redundancy group comprising a first gateway device and a second gateway device configured to forward packets sent from hosts, the method comprising:
assigning a first address set to the first gateway device, wherein the first address set comprises a plurality of forwarding addresses, further wherein the first gateway device is configured to forward packets sent by hosts and addressed to

forwarding addresses in the first address set;

assigning a second address set to the second gateway device, wherein the second address set comprises a plurality forwarding addresses, further wherein the second gateway device is configured to forward packets sent by hosts and addressed to forwarding addresses in the second address set;

measuring the traffic flow to each forwarding address;

adjusting the measured traffic flow using one of the forwarding addresses in one of the assigned forwarding address sets.

11. The method of Claim 10 wherein adjusting the traffic flow comprises instructing a host to use the assigned forwarding address having the lowest measured traffic flow on the gateway device having the lowest measured traffic flow.

12. The method of Claim 10 wherein the forwarding addresses are vMAC addresses.

13. The method of Claim 10 wherein the first gateway device is a first router and the second gateway device is a second router.

14. The method of Claim 10 wherein adjusting the traffic flow comprises re-assigning one of the forwarding addresses from the first address set to the second address set.

15. A computer program product comprising:

a machine readable medium; and

program instructions contained in the machine readable medium, the program instructions specifying a method of controlling traffic flow in a load-sharing redundancy group comprising a first gateway device and a second gateway device configured to forward packets from hosts, the method comprising:

assigning a first plurality of forwarding addresses to the first gateway device;

assigning a second plurality of forwarding addresses to the second gateway device;

the redundancy group distributing forwarding addresses to hosts to use in sending packets to the redundancy group;

the hosts sending packets using the distributed forwarding addresses;

measuring the traffic flow for each of the assigned forwarding addresses;

comparing the measured traffic flow to a target traffic flow; and

adjusting the traffic flow.

16. The computer program product of Claim 15 wherein the load-sharing redundancy group implements Cisco GLBP and further wherein the first gateway device is a first router and the second gateway device is a second router.

17. The computer program product of Claim 15 wherein each forwarding address is a MAC address.

18. The computer program product of Claim 17 wherein each MAC address is a vMAC address.

19. The computer program product of Claim 15 wherein adjusting the traffic flow

comprises altering the distribution of forwarding addresses to hosts.

20. The computer program product of Claim 19 wherein altering the distribution of forwarding addresses to hosts comprises replying to ARP inquiries from hosts using the forwarding address having the lowest measured traffic flow on the gateway device having the lowest measured traffic flow.

21. The computer program product of Claim 15 wherein adjusting the traffic flow comprises re-assigning a forwarding address to a different gateway device.

22. The computer program product of Claim 15 wherein the redundancy group is configured to provide failover services in the event that one of the gateway devices ceases operation.

23. The computer program product of Claim 15 wherein the target traffic flow is equal distribution of traffic across the first gateway device and the second gateway device and further wherein adjusting the traffic flow comprises adjusting the traffic flow across the first gateway device and the second gateway device to more equally distribute the measured traffic flow between the first gateway device and the second gateway device.

24. An apparatus for controlling traffic flow in a load-sharing redundancy group comprising a first gateway device and a second gateway device configured to forward packets sent from hosts, the apparatus comprising:

means for assigning a first plurality of forwarding addresses to the first gateway device;

means for assigning a second plurality of forwarding addresses to the second

gateway device;

means for distributing forwarding addresses to hosts to use in sending packets to the redundancy group;

means for having the hosts sending packets using the distributed forwarding addresses;

means for measuring the traffic flow for each of the assigned forwarding addresses;

means for comparing the measured traffic flow to a target traffic flow; and

means for adjusting the traffic flow.

25. The apparatus of Claim 24 wherein the means for adjusting the traffic flow comprises means for altering the distribution of forwarding addresses to hosts.

26. The apparatus of Claim 25 wherein the means for altering the distribution of forwarding addresses to hosts comprises means for replying to ARP inquiries from hosts using the forwarding address having the lowest measured traffic flow on the gateway device having the lowest measured traffic flow.

27. The apparatus of Claim 24 wherein the means for adjusting the traffic flow comprises means for re-assigning a forwarding address to a different gateway device.

28. The apparatus of Claim 24 wherein the redundancy group is configured to provide failover services in the event that one of the gateway devices ceases operation.

29. The apparatus of Claim 24 wherein the target traffic flow is equal distribution

of traffic across the first gateway device and the second gateway device and further wherein the means for adjusting the traffic flow comprises means for adjusting the traffic flow across the first gateway device and the second gateway device to more equally distribute the measured traffic flow between the first gateway device and the second gateway device.

30. A primary gateway device configured to control traffic flow in a load-sharing redundancy group comprising the primary gateway device and a second gateway device configured to forward packets sent from hosts, the gateway device comprising:

one or more processors;

a memory in communication with at least one of the processors, wherein at least one of the processors and the memory are configured to:

assign a first plurality of forwarding addresses to the primary gateway device;

assign a second plurality of forwarding addresses to the second gateway device;

distribute forwarding addresses to hosts to use in sending packets to the redundancy group;

send packets using the forwarding addresses distributed to the primary gateway device;

measure the traffic flow for each of the assigned forwarding addresses in the primary gateway device and the second gateway device;

compare the measured traffic flow to a target traffic flow; and

adjust the traffic flow.

31. The primary gateway device of Claim 30 wherein each forwarding address is a

MAC address.

32. The primary gateway device of Claim 31 wherein each MAC address is a vMAC address.

33. The primary gateway device of Claim 30 wherein adjusting the traffic flow comprises altering the distribution of forwarding addresses to hosts.

34. The primary gateway device of Claim 33 wherein altering the distribution of forwarding addresses to hosts comprises replying to ARP inquiries from hosts using the forwarding address having the lowest measured traffic flow on the gateway device having the lowest measured traffic flow.

35. The primary gateway device of Claim 30 wherein adjusting the traffic flow comprises re-assigning a forwarding address to a different gateway device.

36. The primary gateway device of Claim 30 wherein the primary gateway device is a first router and the second gateway device is a second router.

37. The primary gateway device of Claim 30 wherein the redundancy group is configured to provide failover services in the event that one of the gateway devices ceases operation.

38. The primary gateway device of Claim 30 wherein the target traffic flow is equal distribution of traffic across the primary gateway device and the second gateway device and further wherein adjusting the traffic flow comprises adjusting the traffic

flow across the primary gateway device and the second gateway device to more equally distribute the measured traffic flow between the primary gateway device and the second gateway device.

39. A primary gateway device configured to control traffic flow in a load-sharing redundancy group comprising the primary gateway device and a second gateway device configured to forward packets sent from hosts, the gateway device comprising:

one or more processors;

a memory in communication with at least one of the processors, wherein at least one of the processors and the memory are configured to:

assign a first address set to the primary gateway device, wherein the first address set comprises a plurality of forwarding addresses, further wherein the primary gateway device is configured to forward packets sent by hosts and addressed to forwarding addresses in the first address set;

assign a second address set to the second gateway device, wherein the second address set comprises a plurality of forwarding addresses, further wherein the second gateway device is configured to forward packets sent by hosts and addressed to forwarding addresses in the second address set;

measure the traffic flow to each forwarding address; and

adjust the measured traffic flow using one of the forwarding addresses in one of the assigned forwarding address sets.

40. The primary gateway device of Claim 39 wherein adjusting the traffic flow comprises instructing a host to use a the assigned forwarding address having the lowest measured traffic flow on the gateway device having the lowest measured traffic flow.

41. The primary gateway device of Claim 39 wherein the forwarding addresses are vMAC addresses.

42. The primary gateway device of Claim 39 wherein the primary gateway device is a first router and the second gateway device is a second router.

43. The primary gateway device of Claim 39 wherein adjusting the traffic flow comprises re-assigning one of the forwarding addresses from the first address set to the second address set.